PIH14

ECONOMIC BURDEN OF COMMUNITY ACQUIRED PNEUMONIA IN OLDER ADULTS IN THE NEW EU COUNTRIES OF THE CENTRAL EUROPE

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OBJECTIVES: Older adults are in an increased risk of respiratory infections including community acquired pneumonia (CAP). The former socialistic countries of the central Europe form a unique region with specific health care and epidemiology characteristics, and where the local evidence on the underlying epidemiology is scarce. The objective was to estimate the economic burden of CAP in adults ≥50 years of age in the Czech Republic (CR), Slovakia (SK), Poland (PL), and Hungary (HU) using data from 2010. **METHODS:** The incidence of hospitalized CAP stratified by age groups 50-64, 65-74, 75-84 and ≥85 was obtained from national surveillance systems (PL, CR, SK) and insurance records (HU). The estimates of non-hospitalised CAP incidence was based on retrospective chart reviews (CZ, SK, PL) and the insurance fund records (HU). Direct costs from the payer's perspective were based on resource use analyses (CR, SK), DRG lists (PL) and the insurance records (HU). **RESULTS:** The incidence of hospitalized CAP per 100,000 person years was: 456.6 (CR), 504.6 (SK), 363.9 (PL), and 845.3 (HU). Compared with adults 50-64 years of age, the incidence of hospitalised CAP were 2.3 fold higher in those 65-74, 5.2 fold higher in 75-84 and 10.8 fold higher in those ≥85, manifesting an exponential trend. While the majority of CAP among adults 50-64 years of age was treated outpatient, the proportion of CAP hospitalized increased with increasing age. The total burden of CAP in adults over 50 was € 12,579,543 (CR); 9,160,774 (SK); 22,409,085 (PL); and 18,298,449 (HU); with hospitalization representing over 90% of the direct costs of treatment in all 4 countries. Adults ≥65, who represent 41% of the combined population, account for 73% of the costs. **CONCLUSIONS:** The incidence and likelihood of hospitalisation drives the costs of CAP upwards with increasing age in the new central EU countries.

PIH15

APPLICATION OF PROBABILISTIC LINKAGE: COMPARE HEALTH CARE COSTS AMONG MENOPAUSAL WOMEN WITH DIFFERENT SYMPTOMS BY LINKING WOMEN'S REGISTRY AND CLAIMS DATABASE

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OBJECTIVES: Menopause symptoms are a good disease severity proxy for menopausal women, but are not available in claims database. We applied probabilistic linkage to add symptoms recorded in a registry database to claims data, and compare the healthcare costs among women with various symptoms. **METHODS:** Women age 45 or older who used estrogen only hormone therapy (HT) were selected from a large US claims database (41/2005-09/30/2008). Another group who used estrogen only HT with a menopause diagnosis was selected from the University of Michigan Women's Registry Database. Logistic regression was used to calculate the propensity score for each patient controlling for osteoporosis, gynecological disorders/procedures, genital infection, bladder/pelvic floor support problem, gynecology system cancer, breast condition, gut condition, hormone disorder, nerve problem, and other individual comorbidities such as rheumatoid disease, depression, and blood clotting. Patients with the closest propensity score from each group were matched, and menopause symptoms for registry patients were added to the claims database records. After repeating probabilistic linkage 250 times, the mean and 95% confidence interval (CI) of healthcare costs during the follow-up period were calculated. **RESULTS:** 80 patients from each population were matched after probabilistically linking 20,020 claims database patients with 83 registry database patients. The average cost of patients with at least one symptom was much higher than for patients without symptoms ($13,570 [95% CI: $13,459-$13,680] vs. $3,391 [95%CI: $3,345-$3,436], p-value<0.001). Cost differences were mainly from inpatient, physician visit, and pharmacy costs. Among patients with menopause symptoms, those with hot flashes had the highest costs ($10,127), followed by memory loss ($1,653), vaginal dryness ($864), reduced libido ($568), and mood swings ($358). **CONCLUSIONS:** Women with menopause symptoms incur higher health care costs than those without This study suggests symptoms are important determinants of health care expenses and their impact can be assessed by linking registry and claims databases.

PIH16

COST-EFFECTIVENESS OF A NEW FIXED-DOSE COMBINATION OF DUTASTERIDE AND TAMSULOSIN FOR THE TREATMENT OF SYMPTOMATIC BENIGN PROSTATIC HYPERPLASIA IN QUEBEC, CANADA

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OBJECTIVES: To evaluate the long-term cost-effectiveness of a fixed-dose combination (FDC) therapy (0.5mg dutasteride and 0.4mg tamsulosin daily) compared to 0.4mg tamsulosin monotherapy for the treatment of symptomatic benign prostatic hyperplasia (BPH). **METHODS:** We developed a Markov state transition model with tunnel state and embedded decision tree. The model follows a Quebec cohort of 312,448 male patients aged ≥50 years, diagnosed with BPH and with symptoms as defined by an International Prostate Symptom Score ≥12. This cohort reflects the population of the 4-year ComBAT trial to evaluate the effect of combination therapy versus either dutasteride or tamsulosin monotherapy on BPH clinical progression and improvement in BPH symptoms. We conduct this analysis from the perspective of the Quebec provincial healthcare system, considering all primary care and hospital costs. Utility estimates were obtained from published literature. Results are presented at 10 years and lifetime (up to 25 years) in the form of incremental costs, incremental QALYs and the incremental cost-effectiveness ratio (ICER). Sensitivity analyses were performed to evaluate the robustness of the model to variations in the underlying input parameters. **RESULTS:** Discounted QALYs per patient at a 10-year time horizon were 6.88 (FDC) and 6.82 (Tamsulosin). At 10 years the ICER for FDC compared with Tamsulosin was CAD $29,860. The ICER decreased over time to reach CAD $29,239 over a lifetime horizon. At a willingness to pay of CAD $50,000 per QALY gained, the probability of FDC being cost-effective for the symptomatic BPH population was approximately 63%. **CONCLUSIONS:** FDC can be cost-effective in treating patients affected with enlarged prostate with moderate or severe symptoms. The sensitivity analyses suggested that variation in main parameters will not alter the behavior of the comparison between the two treatments (i.e. FDC is always more effective and more costly than tamsulosin at a lifetime time horizon).

PIH17

COST-EFFECTIVENESS ANALYSIS OF ANTI-PNEUMOCOCCAL VACCINATION IN HIGH RISK AND ADULT PATIENTS IN ECUADOR

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OBJECTIVES: Despite the Ecuadorian policy of vaccination for high risk persons and adults over 50 years age with 23-valent pneumococcal polysaccharide vaccine (PPSV23), *Streptococcus pneumonia* infections continue to be the most common disease, causing approximately 3,158 deaths every year and raising public health costs. A 13 valent pneumococcal conjugate vaccine (PCV13) has recently been approved for use in adults, and is expected to have an additional impact on disease burden due to covered serotypes. The purpose of this study was to compare PPSV23 and PCV13 vaccines from an Ecuadorian public perspective. **METHODS:** A cost-effectiveness analysis based on a Markov model was developed comparing the impact and cost-effectiveness of PPSV23 and PCV13 for the prevention of pneumococcal disease in high risk adult population. Time horizon of the model was 35 years, with annual discounting of 5% per annum. The effectiveness measure was the number of cases avoided and cost differences between the interventions. Resource use and costs were obtained from Ministry of Health published data, INEC, and SIREVA reports. Costs were collected from local healthcare databases. **RESULTS:** The model reveals that PCV13 is a cost-saving alternative compared to PPSV23. Vaccination with PCV13 is estimated to prevent an additional 1443 cases of bacteremia; 162 cases of meningitis; 11,236 cases of inpatient pneumonia; 1,241 cases of outpatient pneumonia and 3413 deaths due disease compared to PPSV23. Furthermore, vaccination with PCV13 is estimated to save thousands: 25,329 USD in medical costs, 3,874 USD in non medical costs and 46.027 USD in medical+ non medical+vaccination costs. **CONCLUSIONS:** In Ecuador, a national policy of vaccination with PCV13 is expected to be a cost-saving strategy in the prevention of pneumococcal disease in high risk patients and adults over 50 years compared to PPSV23. PPV13 is expected to generate reduction on mortality and morbidity with lower expected costs.

PIH18

REGIONAL COST-EFFECTIVENESS ANALYSIS OF UNIVERSAL CHILDHOOD HEPATITIS A VACCINATION IN BRAZIL

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OBJECTIVES: To conduct a cost-effectiveness analysis of a universal childhood hepatitis A vaccination program in Brazilian regions with different hepatitis A endemicity. **METHODS:** An age and time-dependent dynamic model was developed to estimate the incidence of hepatitis A for 24 years. The analysis was run separately, according to the pattern of regional endemicity, one for Southern + Southeast (low endemicity) and one for the North + Northeast + Midwest (intermediate endemicity). The decision analysis model compared universal childhood vaccination with current program of vaccinating high risk individuals. Epidemiologic and cost estimates were based on data retrieved from a nationwide seroepidemiological survey for viral hepatitis, primary data collection, National Health Information Systems and literature. The analysis was conducted from the healthcare system and societal perspectives. Costs are expressed in 2008 Brazilian reals. **RESULTS:** In this model a universal national immunization program would have a significant impact on disease epidemiology in all regions, resulting in 64% reduction in the number of cases of icteric hepatitis, 59% reduction in deaths due to disease and a 62 % decrease of life years lost, in a national perspective. With a vaccine price per dose of R$16.89 (US$7.23), vaccination against hepatitis A was a cost-saving strategy in the low and intermediate endemicity regions and in Brazil as a whole from healthcare and society perspective. Results were most sensitive to icteric hepatitis incidence, ambulatory cases and vaccine costs. **CONCLUSIONS:** Universal childhood vaccination program against hepatitis A could be a cost-saving strategy in all regions of Brazil. These results may be useful for the Brazilian government for vaccine related decisions and for monitoring population impact if the vaccine is included in the National Immunization Program.

PIH19

IMPACT OF INSURANCE COVERAGE FOR IN VITRO FERTILIZATION ON THE COST PER LIVE BIRTH IN THE US

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BACKGROUND: Utilization of In Vitro Fertilization (IVF) to treat infertility is increasing, despite the high cost incurred, often resulting in multiple births with poor outcomes. Physicians practicing in states with insurance mandates have been shown to transfer fewer embryos, resulting in fewer multiple births and improved outcomes. **OBJECTIVES:** The objective of this study was to compare the impact of mandated IVF insurance coverage on the cost per live birth of healthy infants and infants born with disability. **METHODS:** A Markov model was developed to calculate the number of live births resulting from a maximum of six IVF cycles, and cumulative costs through initial hospital discharge. Age-specific utilization rates, pregnancy rates, birth rates, multiple rates, and costs for states with and without insurance mandates were derived from the literature, insurances claims databases, and publicly available CDC data. The model takes a societal perspective and reports results in 2010 US dollars. **RESULTS:** In hypothetical cohorts of 10,000, for women under the age of 35-years, the insurance strategy results in 42 fewer births with disability. The non-insurance strategy results in 31 additional healthy births but at a cost of $1,831,462 per healthy birth. For women aged 35-37, the insurance strategy dominates the non-insurance strategy with 12 additional births with disability, and 282 additional healthy births. For women aged 38-40, the insurance strategy dominates the non-insurance strategy with 0 additional births with disability, and 46 additional healthy births. For women aged 41-42, the insurance strategy results in 23 fewer births with disability, and 1 fewer healthy birth. The cost for each additional healthy birth is $244,903,064. **CONCLUSIONS:** This study shows insurance coverage for IVF is a "cost-effective", and in some age groups a dominant strategy, even in the short time horizon from delivery through initial discharge and should be considered for inclusion as a standard insurance benefit.

PIH20

COST MINIMIZATION ANALYSIS OF THE DIENOGEST USE IN PATIENTS WITH ENDOMETRIS IN COLOMBIA AND ARGENTINA

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OBJECTIVES: This study provides the results from a minimization costs model that compares the use of Dienogest with the use of GnRH antagonist in women with Endometriosis diagnosis in Colombia and Argentina. **METHODS:** We used a cost minimization model. The case base are women with endometriosis diagnosis in a 1 year time horizon. For the Colombian analysis we used a public perspective while in Argentina we used a social work perspective and a prepaid medical services perspective. The costs used in this model are direct costs and were obtained from some insurers of Colombian and Argentinean health system. The colombian treatment schedule is: 12-month use of Dienogest vs. 6-month use of the GnRH antagonist, and the Argentina treatment schedule is: 12-month use of Dienogest vs 6-month use of GnRH antagonist + 6-month use of supportive treatment (treatment schedule 1), or 12-month use of Dienogest vs 9-month use of GnRH antagonist + 9-month use of add-back treatment + 3-month use of supportive treatment (treatment schedule 2). **RESULTS:** For the case base studied, we found that in Colombia the total treatment cost is US$986.19 with Dienogest and US$2855.57 with the GnRH antagonist. In the other hand in Argentina. The total treatment cost for the treatment schedule 1 is US$534.57 with Dienogest and US$881 with the GnRH antagonist from the social work perspective, and $490.75 with Dienogest and 812.21 the GnRH antagonist from the prepaid medical services perspective. The total treatment cost for the treatment schedule 2 is US$534.57 with Dienogest and US$1488.28 with the GnRH antagonist from the social work perspective, and $490.75 with Dienogest and US$1386.21 the GnRH antagonist from the prepaid medical services perspective. **CONCLUSIONS:** The use of Dienogest minimizes the total cost either in Colombia and Argentina from any perspective.

PIH21

COST IMPACT ANALYSIS OF AN END-OF-LIFE CARE PROGRAM FOR NURSING HOME RESIDENTS: THE PRELIMINARY RESULTS FROM PROJECT CARE

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OBJECTIVES: In Singapore, the default option for medical care among nursing home (NH) residents at their end of life is hospital admission, incurring high healthcare costs. Palliative care has been shown to reduce healthcare costs at the end-of-life; however, NHs are not equipped to offer this. Project CARE was introduced in 7 NHs by a hospital unit to provide palliative care for NH residents. Our objective is to evaluate the cost impact of Project CARE on NH residents at the end-of-life. **METHODS:** Project CARE was provided to a prospective cohort identified with a risk of dying within the next 1-year. A retrospective control group deceased within 2-years prior to the inception of Project CARE was identified. Comparisons between Project CARE and routine care were made for the following time points: 1- and 3-months prior to death. We adopted the health system perspective, including the cost incurred for palliative care visits, hospitalization length of stay (LOS), nursing home LOS, emergency visits, specialist visits and primary care visits. Differences in cost at 1- and 3-months prior to death were analyzed using linear regression of log transformed cost adjusting for patient characteristics. **RESULTS:** A total of 429 residents (cases: 96, controls: 333) were included for the study. Mean age of cases and controls were 85 and 82 years respectively. At 3 months prior to death, Project CARE cost 2.5% (95% CI: -18.2%, 23.1%) more than the routine care. A 20% (95% CI: -42%, 1.8%) savings was observed at 1 month prior to death. However, both observations were not statistically significant. **CONCLUSIONS:** Costs were not significantly different between Project CARE and routine care. High start-up cost of the program might have offset savings from reduction in hospitalization. We postulate potential cost savings as the program reaches full capacity.

PIH22

QUALITY OF PEDIATRIC COST-UTILITY ANALYSES 1997-2009

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OBJECTIVES: High quality economic evidence is necessary for optimizing pediatric health care allocation. The objectives were to appraise the quality of published pediatric cost utility analyses (CUA). It was hypothesized that higher quality would be associated with later publications, publication in a health economics/methods journal and prospective utility assessment. **METHODS:** Pediatric CUAs published in 1997-2009 were assessed. Studies were retrieved from the Pediatric Economic Database Evaluation project (PEDE), a comprehensive database of pediatric health economic evaluations. Quality was assessed using the Pediatric Quality Appraisal Questionnaire which scores 14 domains from 0 to 1. Higher domain scores indicate better quality. Multiple linear regression was used to examine the effect of journal type, whether utility was measured prospectively in the study, and year of publication on each domain score. **RESULTS:** There were 305 CUAs published over the study interval. The annual number of pediatric CUAs increased over time. Most studies were undertaken in North America and Europe. Infectious diseases and their treatment and prevention was the most common therapeutic area (48%). Young children (1 to 12 years old) were studied most often (39%). Utility was measured prospectively in only 8% of studies. Quality was appraised in a random sample of 213 CUAs. Mean domain scores ranged from 0.57 (Analysis) to a high of 0.91 (Target population). Studies published in methods/economics journals demonstrated significantly higher scores for 7 domains ($p<0.05$). Studies that measured utility prospectively scored significantly higher on the Analysis domain. Multiple regression results showed that quality of five domains improved over time ($p<0.05$). **CONCLUSIONS:** While quality in some domains improved over time, others did not. Variability in quality of pediatric CUAs indicates that caution should be exercised when interpreting results for decision making. Challenges in conducting economic evaluations in children, such as prospective utility measurement, require further research.

PIH23

ECONOMIC IMPACT OF BREAST PAIN AND BLEEDING AMONG WOMEN PRESCRIBED ESTROGEN PLUS PROGESTOGEN HORMONE THERAPY

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OBJECTIVES: To examine in a retrospective study the incremental health care costs of breast pain and endometrial bleeding among postmenopausal women prescribed progestin containing Hormone Therapy (HT). **METHODS:** Women age 45 to 65 who were prescribed HT (01/01/2006-09/30/2008) were selected from a large US claims database. The date of the first identified HT prescription was assigned as the index date. Patients were required to have at least 1 quarter of continuous medical and pharmacy benefits before and after the index date. Patients evidencing breast pain and/or endometrial bleeding during the follow-up period were assigned to the 'selected AEs' cohort, and the remaining patients were assigned to the 'no selected AEs' cohort. Patients were followed for at most 8 full quarters. A two-part model using logistic regression and a mixed model with repeated measurements were used in the multivariate analysis. Patients' age, medication, procedures, and health care costs during the pre-index period were adjusted in the model. Adjusted total health care costs for each quarter, 1st and 2nd years of the follow-up period, and average annual costs were provided. **RESULTS:** A total of 5,325 patients were included in the 'selected AEs' cohort and 49,942 in the 'no selected AEs' cohort. After adjusting for baseline differences, the adjusted quarterly costs ranged from $1944 to $2185 for the 'selected AEs' cohort and from $1699 to $1971 for the 'no selected AEs' cohort. The quarterly health care cost differences between the two cohorts were from $250 ($p<0.0001$) at first quarter to $214 ($p<0.0001$) at 8th quarter. The adjusted annual health care costs were higher for patients with the selected AEs ($8195 vs. $7238; $p<0.0001$). **CONCLUSIONS:** This study shows that the incremental total health care costs associated with endometrial bleeding and breast pain are on average $239 quarterly and $957 annually, in a US managed care setting.

PIH24

MODELING THE HEALTH AND MEDICAL CARE SPENDING OF THE FUTURE ELDERLY: AN UPDATE USING THE FUTURE ELDERLY MODEL

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OBJECTIVES: Developed over the past 15 years, the Future Elderly Model (FEM) is a demographic and economic model to predict future costs and health status for the elderly. The present study updates the model by incorporating health behaviors, which can have significant impacts on the use and value of new health care technologies. In addition, it extends the FEM to new disease areas, including: cognitive impairment and Alzheimer's; aging-related interventions; diabetes; socioeconomic disparities; the health consequences of reimbursement for medical innovations; and the productivity benefits of improved health in older populations. **METHODS:** The FEM uses a representative sample of Americans aged 51+, from the Health and Retirement Study (HRS). Based on the observed risks and transitions in the HRS, the FEM models how individuals grow old, acquire diseases and disabilities, and die. The FEM is coupled with expert panels and reviews of the literature designed to elicit the most likely scenarios for new technological changes.